United States
Department of
Agriculture

Soil
Conservation
Service

Bozeman,
Montana

MONTANA WATER SUPPLY OUTLOOK

February 1, 1986

Foreword

How Forecasts Are Made

Most of the annual streamflow in the Western United States originates as snowfall. This snowfall accumulates high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are viewed in conjunction with snowpack data to prepare runoff forecasts. This report presents a comprehensive picture of water supply outlook conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data and narratives describing current conditions.

Streamflow forecasts are cooperatively generated by Soil Conservation Service and National Weather Service hydrologists. Forecasts become more accurate as more data affecting runoff becomes known. For this reason, forecasts are issued that reflect three future precipitation conditions — Below Normal, Average, and Above Normal. These forecasts are termed reasonable minimum, most probable, and reasonable maximum. Actual streamflow can be expected to fall between the lower and upper forecast values eight out of ten years.

Snowpack data are obtained by using a combination of manual and automated measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation, temperature, and other parameters are monitored on a daily basis and transmitted via radio telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

For More Information

Copies of Monthly Water Supply Outlook Reports and other reports may be obtained from the states listed below. Because of the limited space, snow survey measurements are not published in monthly reports. An annual snow survey data summary is published by the Soil Conservation Service for each of the western states. Historical snow survey data may be obtained at those same offices.

STATE	ADDRESS
Alaska	201 East 9th Ave., Suite 300, Anchorage, AK 99501-3687
Arizona	201 East Indianola, Suite 200, Phoenix, AZ 85012
Colorado (New Mexico)	2490 West 26th Ave., Denver, CO 80211
Idaho	304 North 8th Street, Room 345, Boise, ID 83702
Montana	10 East Babcock, Room 443, Federal Building, Bozeman, MT 59715
Nevada	50 South Virginia Street, Third Floor, Reno, NV 89505
Oregon	1220 Southwest 3rd Ave., 16th Floor, Portland, OR 97204
Utah	4402 Federal Building, 125 South State Street, Salt Lake City, UT 84147
Washington	360 U.S. Court House, Spokane, WA 99201
Wyoming	Federal Building, 100 East "B" Street, Casper, WY 82602

In addition to state reports, a Water Supply Outlook for the Western United States is published by the Soil Conservation Service and National Weather Service monthly, January through May. Reports may be obtained from the Soil Conservation Service, West National Technical Center, 511 Northwest Broadway, Room 547, Portland, OR 97209.

Published by other agencies:

Water Supply Outlook Reports prepared by other agencies include: California — Snow Survey Branch, California Department of Water Resources, P.O. Box 388, Sacramento, CA 98502; British Columbia — The Ministry of Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia, V8V 1X5; Yukon Territory — Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory, Y1A 3V1; Alberta, Saskatchewan, and N.W.T. — The Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta, T3C 1A6.

Montana
Water Supply Outlook

and

Federal – State – Private
Cooperative Snow Surveys

Issued by

Wilson Scaling
Chief
Soil Conservation Service
Washington, D.C.

Released by

Glen H. Loomis
State Conservationist
Soil Conservation Service
Bozeman, Montana

Prepared by

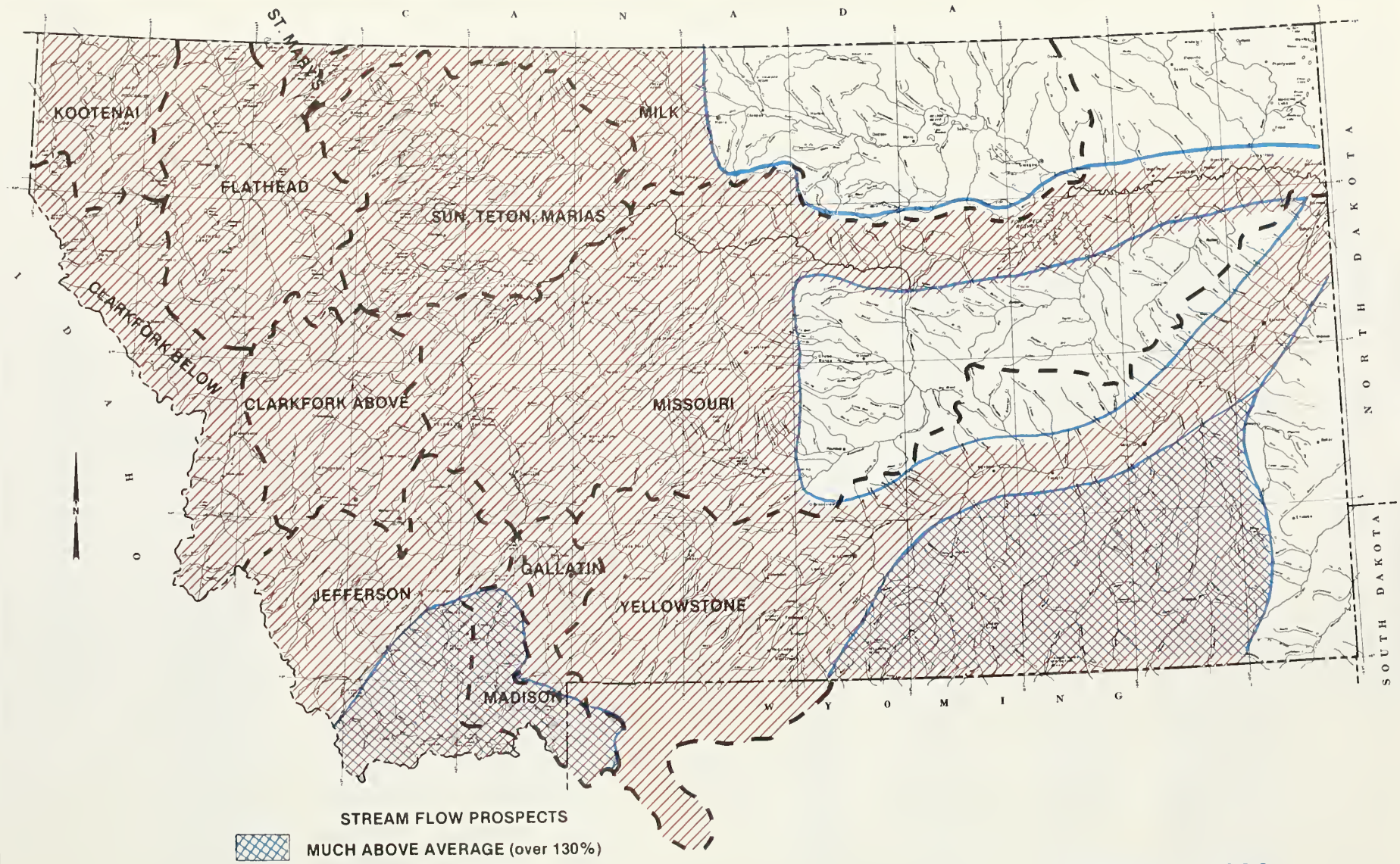
Phillip E. Farnes
Snow Survey Supervisor
Soil Conservation Service
10 E. Babcock
Bozeman, Montana 59715

U.S. DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

STREAMFLOW PROSPECTS FOR MONTANA

Spring and Summer Period



STREAM FLOW PROSPECTS

- MUCH ABOVE AVERAGE (over 130%)
- ABOVE AVERAGE (110-130%)
- NEAR AVERAGE (90-110%)
- BELOW AVERAGE (70-90%)
- MUCH BELOW AVERAGE (below 70%)
- NOT FORECAST

February 1,1986

0 25 50 75 100 Mi

0 50 100 150 KM

SOURCE:
Information provided by SCS Snow Survey Personnel.

JUNE 1985 4-R-39296

USDA SCS FORT WORTH, TEXAS 1985

GENERAL OUTLOOK

SUMMARY:

Unless weather patterns change to a more favorable moisture flow across Montana, the state could be facing water shortages similar to or even worse than last year. Usually about 60 percent of the season's snowpack is on the ground by February 1. Both December and January are normally good moisture months but this year both have been below average in most areas.

SNOWPACK:

With the exception of three small areas, the entire state has below average snowpack. In most areas, the water stored in the snow is between 65 and 80 percent of average. There is generally less snow now than there was a year ago. Parts of the Big and Little Belt Mountains near central Montana, the Ruby, Red Rock and Madison River headwaters in southwest Montana, and the Bighorn Mountains in the south central area are the only locations which have received near average snowfall.

PRECIPITATION:

January mountain precipitation was about average along the Canadian border in northwest Montana. All other areas had below average moisture. The Sun-Teton-Marias area recorded only about 50 percent of average precipitation while the Gallatin recorded 65 percent. All other areas received 75 to 85 percent of average mountain precipitation in January.

RESERVOIRS:

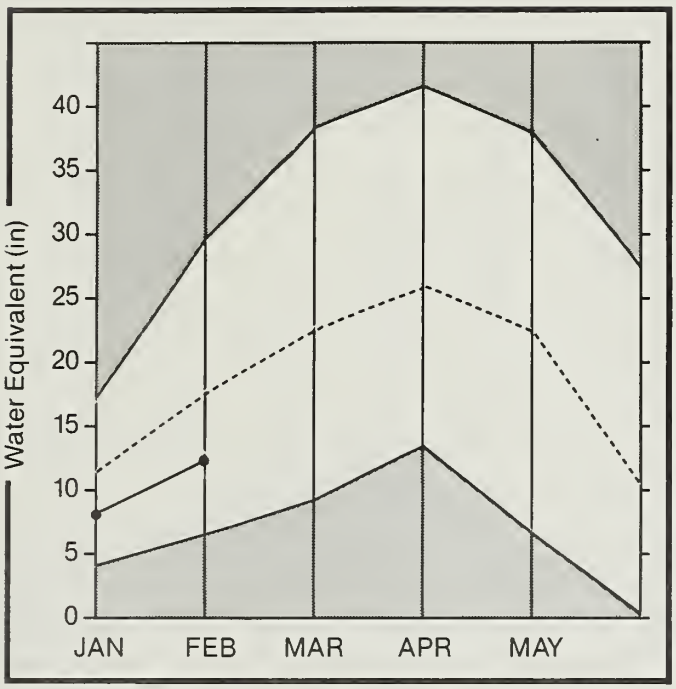
Most irrigation reservoirs have near to a little above average water in storage except in the Milk River system. Fresno and Nelson are below average, but have more stored than at this time last year. Most major multipurpose reservoirs are at about average storage levels. Carryover storage in many reservoirs was good this year due in part to well above average rainfall last August and September.

STREAMFLOW:

Spring and summer runoff is expected to be near average on the Beaverhead, Ruby and Madison Rivers in southwest Montana. All other streams are forecast to have flows in the 70 to 90 percent range. These forecasts are based on the assumption that moisture for the rest of the season will be near normal. If the current below average moisture trend continues, these forecasts will be lowered as the season progresses.

Kootenai Basin

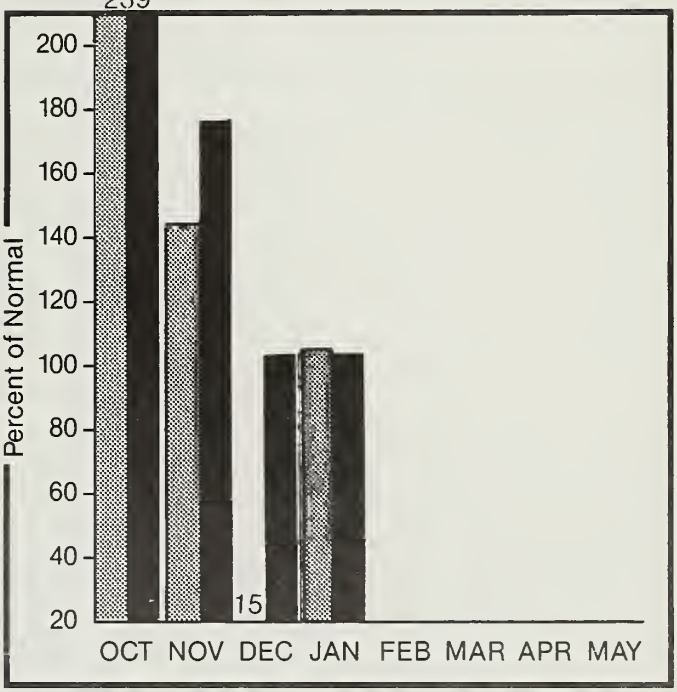
Mountain snowpack* (inches)



* Kootenai in Montana

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK

Mountain precipitation was near average in January. Present snowpack is about 75 percent of average over the entire drainage, with conditions being a little better in Canada. Streamflow forecasts based on current snow, precipitation and soil moisture are fo a little below average flows on the Kootenai with below average runoff coming from tributaries in Montana.

For more information contact your local Soil Conservation Service office.

KOOTENAI RIVER BASIN in Montana

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
KOOTENAI RIVER near Libby *	APR-JUL	6020.0	5420.0	90	113	67				
	APR-SEP	7041.0	6340.0	90	113	67				
FISHER RIVER near Libby	APR-JUL	248.0	217.0	87	115	60				
	APR-SEP	264.0	230.0	87	115	59				
YAAK RIVER near Troy	APR-JUL	500.0	437.0	87	115	59				
	APR-SEP	523.0	462.0	88	116	60				
KOOTENAI RIVER at Leonia *	APR-JUL	7498.0	6860.0	91	113	69				
	APR-SEP	8602.0	7870.0	91	113	69				
	APR-JUN	6051.0	5445.0	89	112	68				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LAKE KOOCANUSA	5748.0	2138.0	2113.0	2406.0

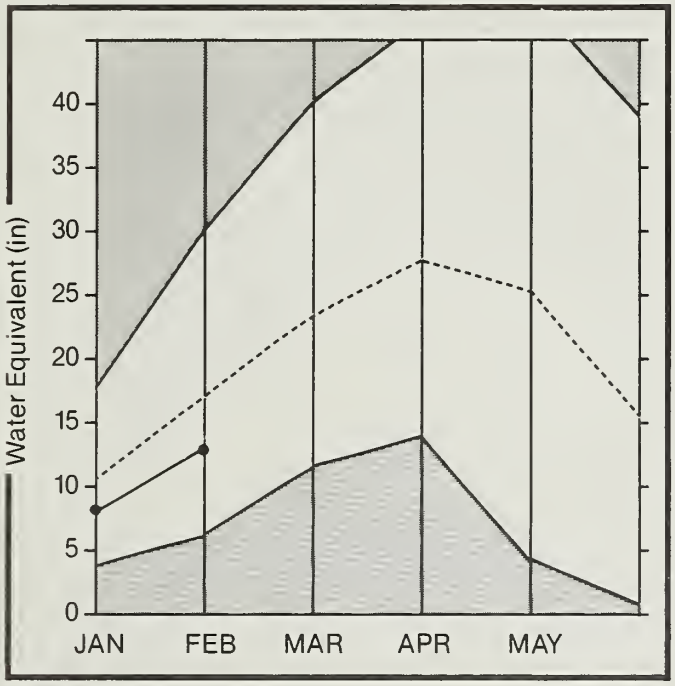
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
EAST KOOTENAI in B.C.	24	89	81
KOOTENAI in MONTANA	19	67	70
KOOTENAI ab BONNERS FERRY	13	77	75

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Flathead Basin

Mountain snowpack* (inches)



* Flathead

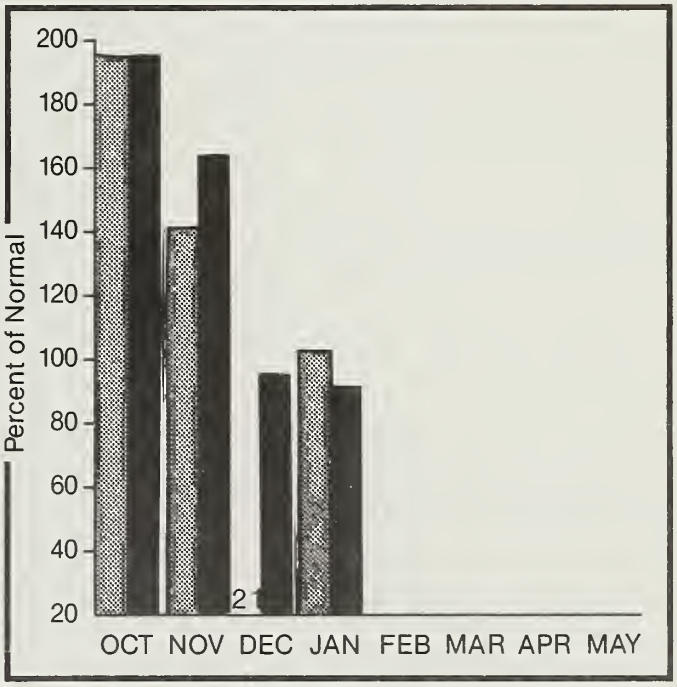
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack conditions continued to deteriorate in January and are now down to about 75 percent of average. Northern drainages have better snow than those in the south. Spring and summer streamflows are forecast to be in the 80 to 85 percent of average range.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
NF FLATHEAD near Columbia Falls	APR-JUL	1732.0	1470.0	84	103	67				
	APR-SEP	1913.0	1620.0	84	103	67				
	APR-JUN	1471.0	1260.0	85	104	68				
MF FLATHEAD near West Glacier	APR-JUL	1713.0	1390.0	81	99	63				
	APR-SEP	1869.0	1520.0	81	99	63				
	APR-JUN	1453.0	1210.0	83	101	65				
SF FLATHEAD near Columbia Falls *	APR-JUL	2142.0	1740.0	81	103	59				
	APR-SEP	2278.0	1850.0	81	107	55				
	APR-JUN	1886.0	1550.0	82	108	56				
FLATHEAD at Columbia Falls *	APR-JUL	5721.0	4750.0	83	101	65				
	APR-SEP	6208.0	5150.0	82	101	65				
	APR-JUN	4921.0	4130.0	83	102	66				
SWAN RIVER near Big Fork	APR-JUL	604.0	500.0	82	101	65				
	APR-SEP	689.0	570.0	82	101	65				
FLATHEAD RIVER near Polson *	APR-JUL	6712.0	5570.0	82	101	65				
	APR-SEP	7278.0	6040.0	82	101	65				
	APR-JUN	5759.0	4800.0	83	101	65				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CAMAS (4)	45.2	18.4	17.0	19.2
MISSION VALLEY (8)	100.0	39.0	34.7	36.5
HUNGRY HORSE	3451.0	2295.0	2308.0	2353.0
FLATHEAD LAKE	1791.0	1124.0	835.3	1179.0

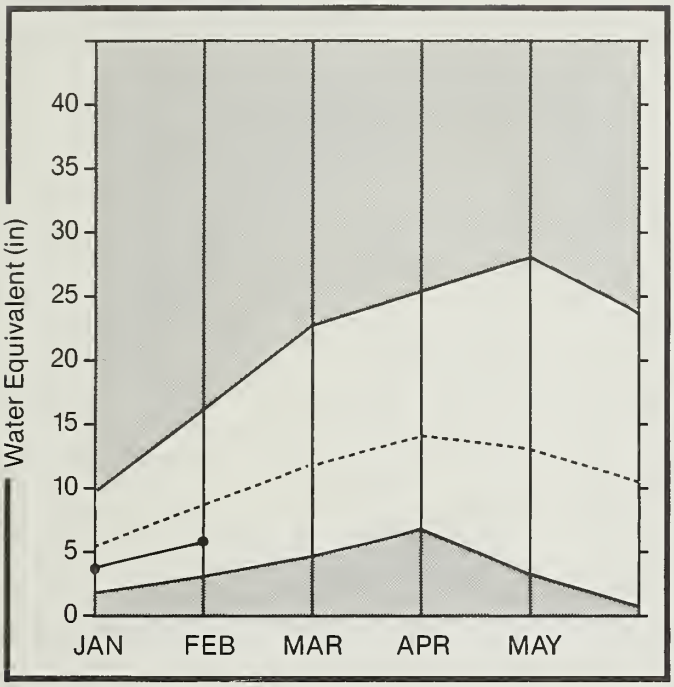
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
LITTLE BITTERROOT	5	82	80
NORTH FORK FLATHEAD	7	67	70
MIDDLE FORK FLATHEAD	9	75	75
SOUTH FORK FLATHEAD	11	68	72
SWAN	8	71	73
STILLWATER-WHITEFISH	6	78	73
FLATHEAD	45	72	74

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Clark Fork Basin above Missoula

Mountain snowpack* (inches)



* Clark Fork above Missoula

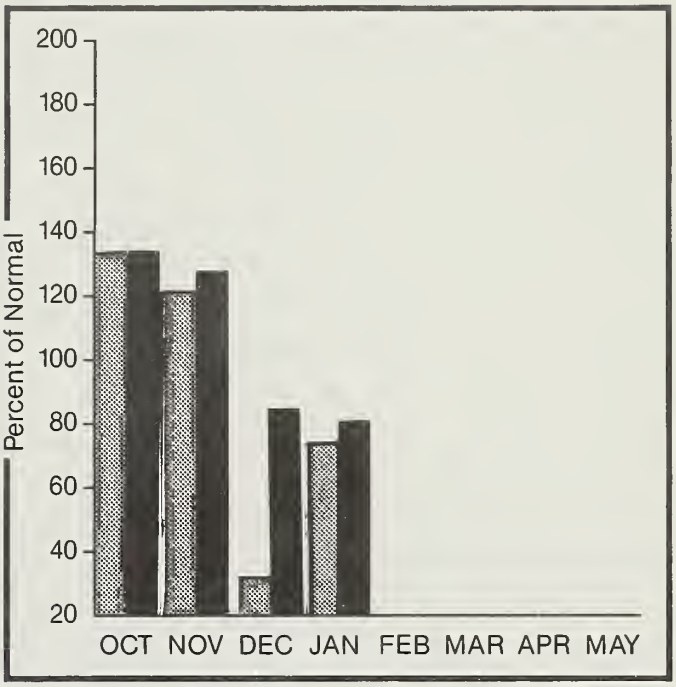
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

January mountain precipitation was about 75 percent of average and snowpack conditions continue to deteriorate. The water stored in the snowpack is nc about 65 percent of average. Streamflow forecasts are generally in the 70 to 80 percent of average range.

For more information contact your local Soil Conservation Service office.

CLARK FORK RIVER BASIN above Missoula

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MOULTON RESERVOIR Inflow (MG)*	APR-JUL	263.0	190.0	72	100	44				
	APR-JUN	237.0	170.0	71	100	44				
WARM SPRINGS CR at Mevers Dam *	APR-JUL	37.8	29.5	78	106	50				
	APR-SEP	46.8	36.6	78	107	49				
FLINT CREEK near Southern Cross *	APR-JUL	15.4	11.4	74	110	39				
	APR-SEP	18.3	13.7	74	115	38				
FLINT CREEK below Boulder Creek *	APR-JUL	59.9	44.8	74	114	37				
	APR-SEP	75.8	57.3	75	113	37				
LOWER WILLOW CR RES Inflow *	APR-JUL	14.9	8.8	59	94	20				
	APR-SEP	15.7	9.6	61	102	25				
M. FK. ROCK CRK near Philipsburg	APR-JUL	70.5	54.7	77	105	50				
	APR-SEP	78.2	60.8	77	106	50				
NEVADA CREEK near Finn	APR-JUL	21.3	15.1	70	108	33				
	APR-SEP	23.0	16.3	70	109	35				
BLACKFOOT RIVER near Bonner	APR-JUL	904.0	685.0	75	94	58				
	APR-SEP	999.0	760.0	76	94	58				
	APR-JUN	782.0	585.0	74	93	57				
CLARK FORK RIVER above Milltown *	APR-JUL	708.0	550.0	77	112	44				
	APR-SEP	816.0	639.0	78	112	44				
	APR-JUN	597.0	466.0	78	116	44				
CLARK FORK RIVER above Missoula	APR-JUL	1612.0	1240.0	76	105	49				
	APR-SEP	1815.0	1400.0	77	105	49				
	APR-JUN	1379.0	1050.0	76	104	48				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
GEORGETOWN LAKE	31.0	24.2	26.6	26.9
LOWER WILLOW CREEK	4.9	1.9	0.3	1.5
NEVADA CREEK	12.6	5.2	4.3	4.4

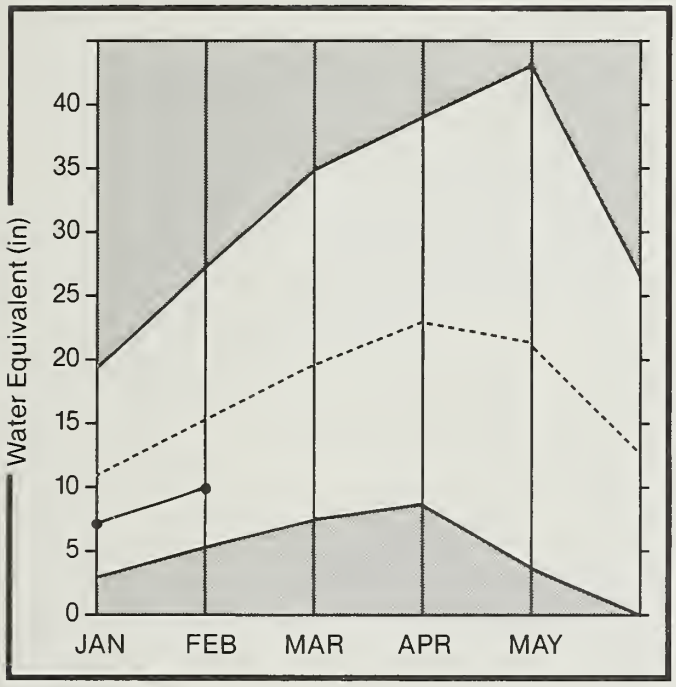
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
CLARK FORK ab BLACKFOOT	31	81	70
BLACKFOOT	17	79	70
CLARK FORK above MISSOULA	49	80	69

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Clark Fork Basin below Missoula

Mountain snowpack* (inches)



* Bitterroot

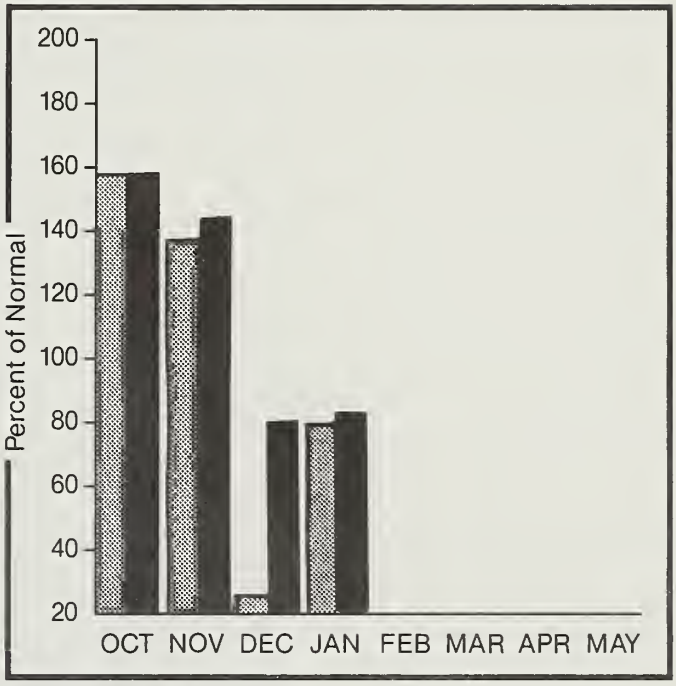
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack is a little better in the lower Clark Fork drainage than in the Bitterroot. However, snow in both areas is only 65 to 70 percent of average. Mountain precipitation was about 80 percent of average during January, so spring and summer streamflow is expected to be in the 75 to 80 percen range.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
CLARK FORK RIVER above Missoula	APR-JUL	1612.0	1240.0	76	105	49				
	APR-SEP	1815.0	1400.0	77	105	49				
	APR-JUN	1379.0	1050.0	76	104	48				
W.F. BITTERROOT RIVER nr Conner *	APR-JUL	164.0	125.0	76	104	48				
	APR-SEP	178.0	135.0	75	104	48				
BITTERROOT RIVER near Darby	APR-JUL	532.0	410.0	77	105	49				
	APR-SEP	580.0	447.0	77	105	49				
	APR-JUN	464.0	365.0	78	107	51				
SKALKAHO CREEK near Hamilton	APR-JUL	48.7	40.0	82	101	64				
	APR-SEP	56.0	45.6	81	100	64				
BURNT FORK CR nr Stevensville *	APR-JUL	32.2	26.0	80	109	53				
	APR-SEP	37.4	30.0	80	107	53				
BITTERROOT RIVER at Missoula *	APR-JUL	1384.0	1060.0	76	105	49				
	APR-SEP	1504.0	1150.0	76	104	48				
	APR-JUN	1191.0	930.0	78	106	50				
CLARK FORK RIVER below Missoula	APR-JUL	2996.0	2300.0	76	97	57				
	APR-SEP	3319.0	2550.0	76	97	57				
	APR-JUN	2570.0	1980.0	77	97	57				
CLARK FORK RIVER at St. Regis	APR-JUL	3928.0	3010.0	76	106	48				
	APR-SEP	4411.0	3340.0	75	105	47				
	APR-JUN	3428.0	2605.0	75	105	47				
CLARK FORK RIVER near Plains *	APR-JUL	11071.0	8690.0	78	101	55				
	APR-SEP	12153.0	9540.0	78	101	56				
	APR-JUN	9459.0	7425.0	78	102	55				
THOMPSON RIVER near Thompson Falls	APR-JUL	233.0	185.0	79	106	53				
	APR-SEP	261.0	209.0	80	106	54				
PROSPECT CREEK at Thompson Falls	APR-JUL	132.0	105.0	79	108	52				
	APR-SEP	142.0	112.0	78	107	51				
CLARK FORK at Whitehorse Rapids *	APR-JUL	12351.0	9550.0	77	101	53				
	APR-SEP	13575.0	10500.0	77	101	53				
	APR-JUN	10570.0	8140.0	77	101	53				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
PAINTED ROCKS LAKE		NO REPORT		
NOXON RAPIDS	335.0	158.8	318.0	312.2
COMO	34.9	12.7	7.9	10.5

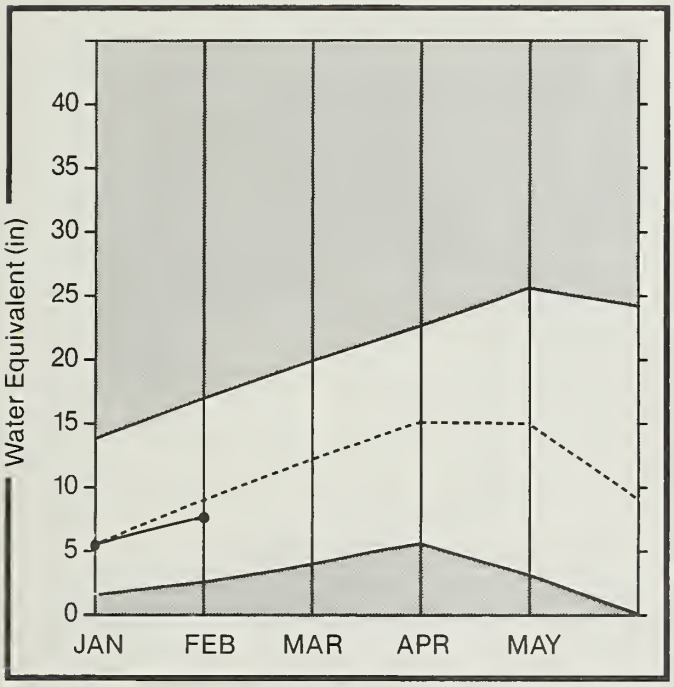
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
CLARK FORK above MISSOULA	49	80	69
BITTERROOT	10	75	65
LWR CLARK FK blw MISSOULA	12	61	68
CLARK FORK	69	72	68
FLATHEAD	44	73	74
PEND O'REILLE	113	72	71

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Jefferson Basin

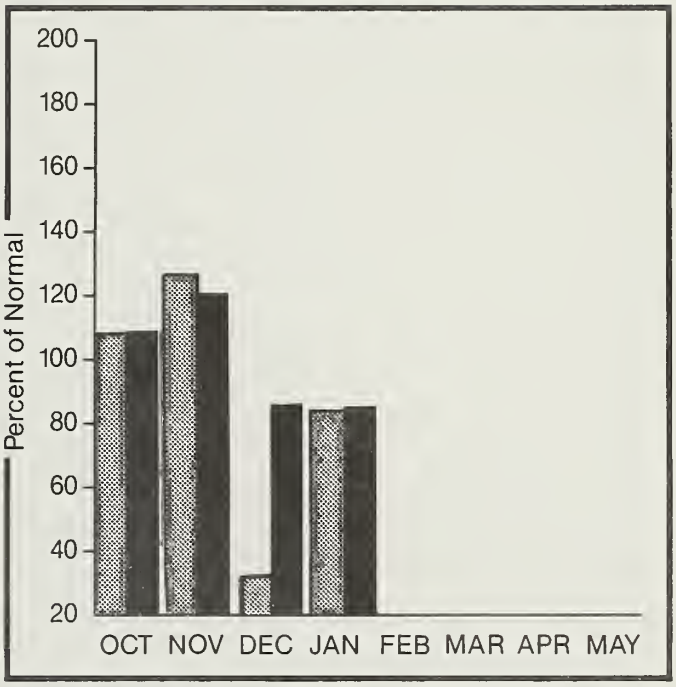
Mountain snowpack* (inches)



* Jefferson

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack varies from a little below average in part of the Ruby River headwaters to well below average over most of the Big Hole and Boulder watersheds. Mountain precipitation during January was about 85 percent of average. Spring and summer streamflows are forecast to be near to a little below average on the Red Rock, Beaverhead and Ruby Rivers and 75 percent of average on the Big Hole.

For more information contact your local Soil Conservation Service office.

JEFFERSON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	MEAS. MAX. (% AVE.)	MEAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
RED ROCK RIVER near Monida *	APR-JUL	96.0	93.2	97	133	61				
	APR-SEP	103.0	100.0	97	133	61				
BEAVERHEAD RIVER near Grant *	APR-JUL	137.0	130.0	94	131	59				
	APR-SEP	158.0	147.0	93	129	57				
BEAVERHEAD RIVER at Barratts *	APR-JUL	180.0	167.0	92	129	57				
	APR-SEP	209.0	193.0	92	128	56				
RUBY RIVER near Alder	APR-JUL	85.0	80.0	94	128	60				
	APR-SEP	101.0	94.0	93	127	59				
BIG HOLE RIVER near Melrose	APR-JUL	698.0	526.0	75	107	43				
	APR-SEP	760.0	567.0	74	107	43				
WILLOW CREEK near Harrison	APR-JUL	17.9	14.2	79	117	39				
	APR-SEP	20.0	16.0	80	120	40				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LIMA	84.0	24.5	25.9	34.4
CLARK CANYON	257.0	137.2	149.2	138.7
RUBY RIVER	38.8	26.2	24.1	23.3

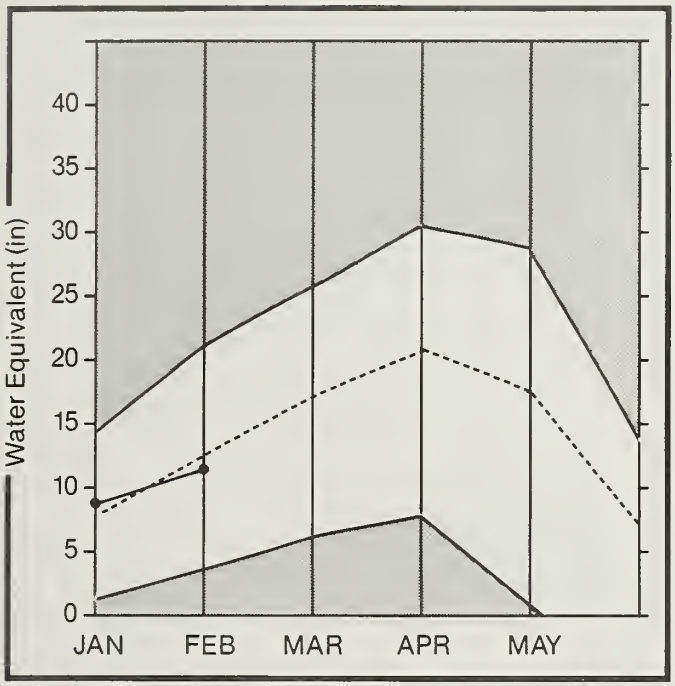
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
BEAVERHEAD	17	102	91
RUBY	5	104	91
BIGHOLE	14	77	70
BOULDER	13	76	67
JEFFERSON	49	89	80

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Madison Basin

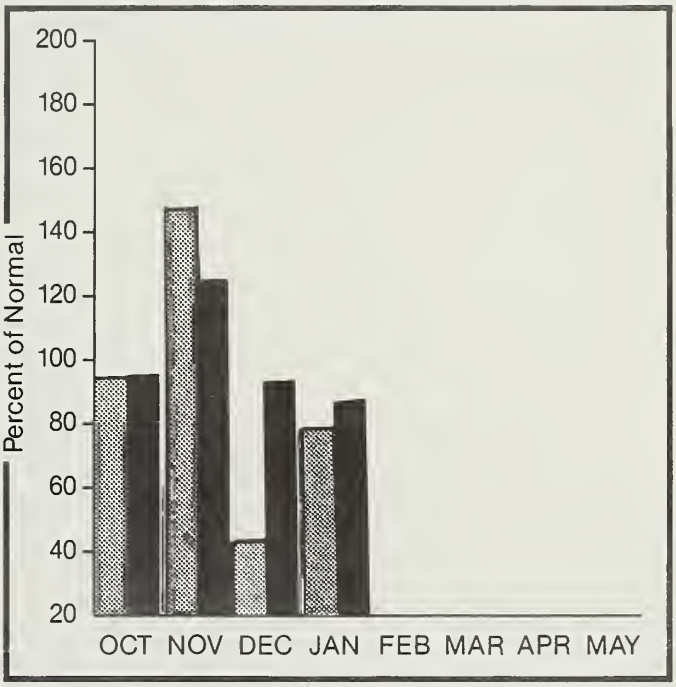
Mountain snowpack* (inches)



*Madison

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK

Snowpack is near average in some of the upstream drainages dropping to below average in the lower reaches. Mountain precipitation was about 80 percent of average in January. Streamflows are predicted to be about average in upstream areas dropping to below average in lower tributaries.

For more information contact your local Soil Conservation Service office.

MADISON RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MADISON RIVER near Gravling *	APR-JUL	388.0	393.0	101	120	82				
	APR-SEP	496.0	498.0	100	119	81				
MADISON RIVER near McAllister *	APR-JUL	672.0	619.0	92	112	72				
	APR-SEP	848.0	770.0	90	111	71				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
ENNIS LAKE	41.0	30.1	31.0	35.6
HEBGEN LAKE	378.0	276.2	310.2	232.6

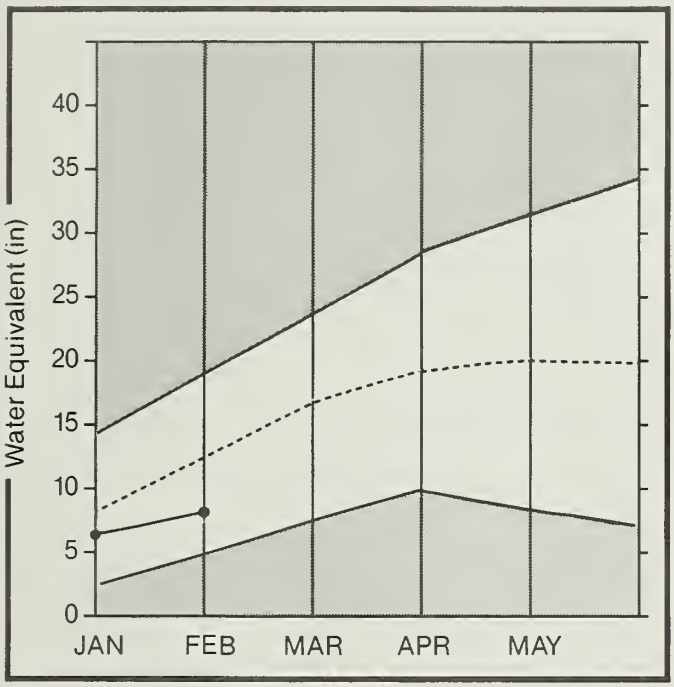
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
MADISON above HEBGEN	12	102	90
LOWER MADISON	8	104	90
MADISON	20	103	90

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Gallatin Basin

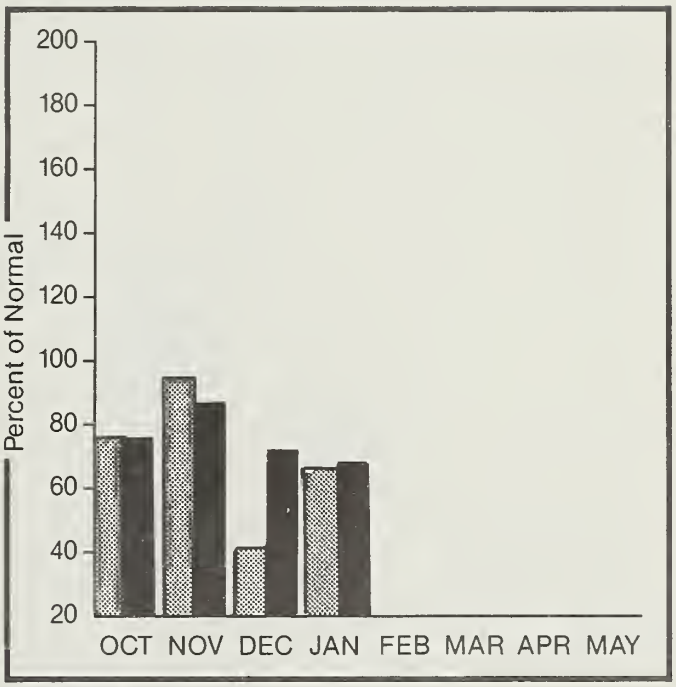
Mountain snowpack* (inches)



*Gallatin

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpacks vary from below average in the southern watersheds to about 50 percent of average in the Bridger Mountains. Mountain precipitation was about 65 percent of average in January. Spring and summer streamflows are forecast to be 20 to 25 percent below average.

For more information contact your local Soil Conservation Service office.

GALLATIN RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
GALLATIN RIVER near Gateway	APR-JUL	464.0	385.0	82	103	63				
	APR-SEP	545.0	445.0	81	102	62				
E & W FK. HYALITE CR. nr Bozeman *	APR-JUL	25.0	20.4	81	100	64				
	APR-SEP	29.0	23.5	81	100	62				
HYALITE CREEK near Bozeman *	APR-JUL	39.0	31.6	81	103	59				
	APR-SEP	45.0	36.0	80	102	58				
GALLATIN RIVER at Logan	APR-JUL	523.0	400.0	76	104	49				
	APR-SEP	611.0	470.0	76	105	49				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
MIDDLE CREEK	8.0	6.2	3.8	3.3

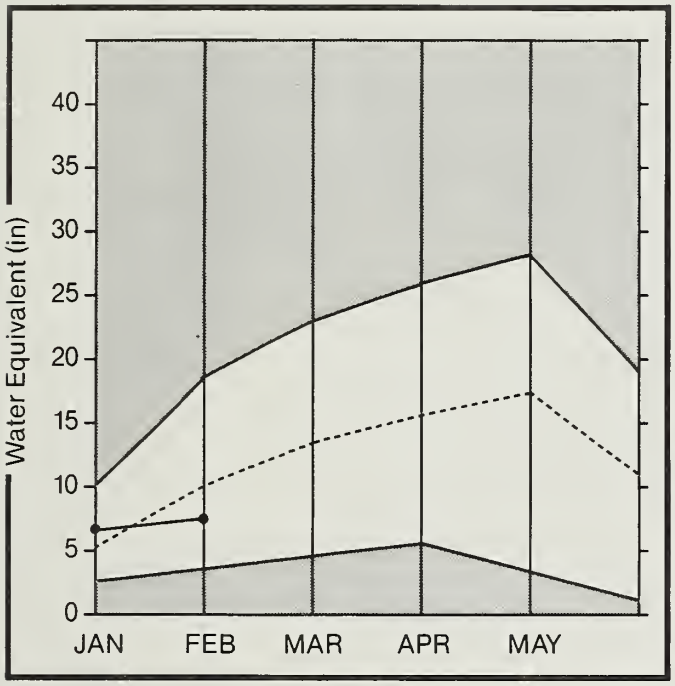
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
UPPER GALLATIN	8	93	75
EAST GALLATIN	12	82	58
GALLATIN	20	87	65

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Missouri Basin

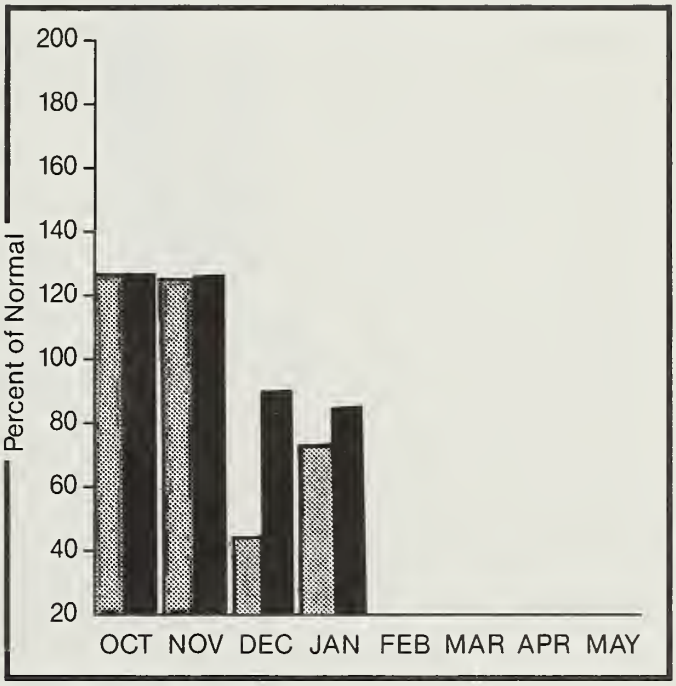
Mountain snowpack* (inches)



*Missouri Toston to Fort Peck

Maximum
Minimum
Average
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snow in the Missouri headwaters is about 75 percent of average. Tributaries on the west side have only slightly better snow cover while east side tributaries are within 10 percent of normal. Mountain precipitation in January was about 75 percent of average. Streamflow forecasts vary from about 80 to 95 percent of average runoff.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	MEAS. MAX. (% AVE.)	MEAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
MISSOURI RIVER at Toston *	APR-JUL	2196.0	1760.0	80	122	45				
	APR-SEP	2545.0	2076.0	81	122	48				
SHEEP CREEK nr White Sulphur Spgs.	APR-JUL	19.0	18.4	96	137	53				
	APR-SEP	22.0	21.2	96	136	55				
BELT CREEK near Monarch	APR-JUL	123.0	110.0	89	128	51				
	APR-SEP	134.0	118.0	88	126	50				
MISSOURI RIVER at Fort Benton *	APR-JUL	3468.0	2618.0	75	125	43				
	APR-SEP	3980.0	3113.0	78	127	46				
MISSOURI RIVER at Virgelle *	APR-JUL	4030.0	3018.0	74	130	44				
	APR-SEP	4570.0	3555.0	77	132	48				
MISSOURI RIVER near Landusky *	APR-JUL	4383.0	3328.0	75	134	44				
	APR-SEP	4980.0	3932.0	78	135	48				
N.F. MUSSELSHELL near Delpine	APR-JUL	5.4	4.5	83	130	37				
	APR-SEP	6.4	5.4	84	125	47				
S.F. MUSSELSHELL above Martinsdale	APR-JUL	59.0	50.0	84	127	42				
	APR-SEP	63.0	54.0	85	127	44				
MISSOURI RIVER below Fort Peck *	APR-JUL	4428.0	3321.0	75	133	43				
	APR-SEP	4961.0	3818.0	76	136	45				
LAKE SAKAKAWEA Inflow *	APR-JUL	12239.0	9791.0	79	130	55				
	APR-SEP	12775.0	10460.0	81	132	58				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
CANYON FERRY LAKE	2043.0	1503.0	1459.0	1613.0
HELENA VALLEY	10.4	4.0	4.6	5.6
LAKE HELENA	10.4	10.9	10.9	10.0
HAUSER & HELENA	61.9	63.0	63.2	60.4
HOLTER LAKE	81.9	80.5	76.3	69.4
SMITH RIVER	10.6	4.1	8.8	6.5
NEWLAN CREEK	12.4	9.7	9.8	9.2
BAIR	7.0	1.3	0.4	4.3
MARTINSDALE	23.1	4.7	5.8	9.5
DEADMAN'S BASIN	72.2	26.6	---	43.2
FORT PECK LAKE	18.9	13.8	15.9	15.1

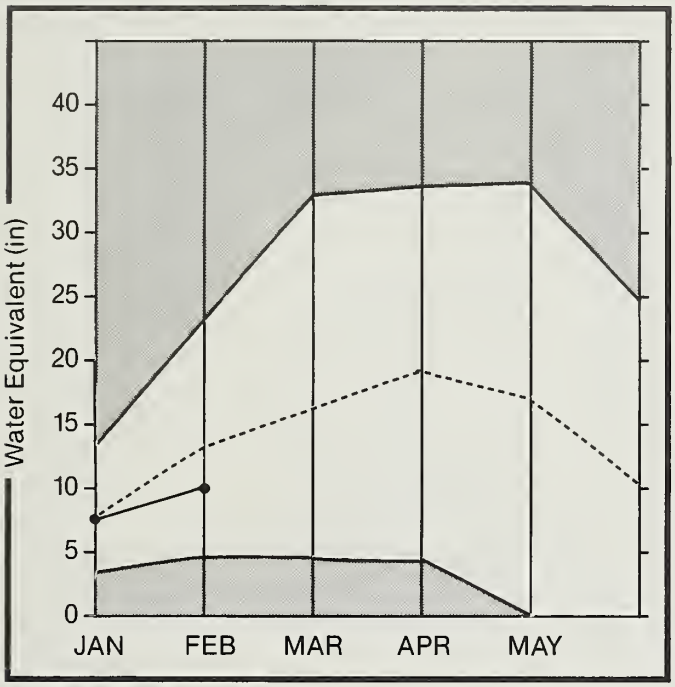
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.0	THIS YEAR AS % OF LAST YR.	AVERAGE
MISSOURI HEADWATERS	103	91	75
WEST SIDE MISSOURI	8	85	77
SMITH-BELT	5	100	92
JUDITH-MUSSELSHELL	8	92	83
MISSOURI MAINSTEM	13	93	84
TOSTON to FORT PECK	29	85	79
MISSOURI above FORT PECK	112	90	79
MILK HEADWATERS	4	55	61
MISSOURI in MONTANA	116	88	78
MISSOURI blw YELLOWSTONE	87	119	91

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Sun, Teton and Marias Basins

Mountain snowpack* (inches)



* Sun-Teton-Marias

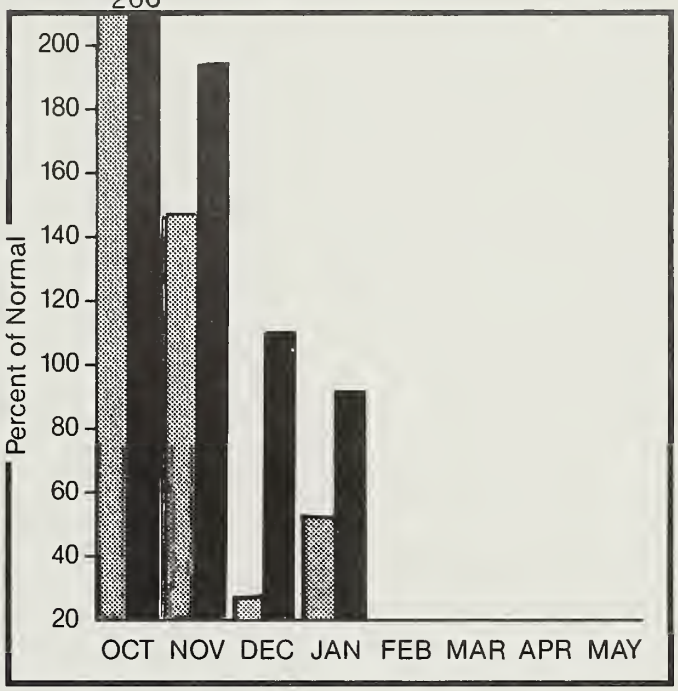
Maximum

Minimum

Average

Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation

Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack levels are about 70 to 75 percent of average in the headwater areas. Mountain precipitation during January was only about 50 percent of average. Spring and summer streamflows are expected to reach the 75 to 80 percent of average range.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SUN RIVER at Gibson Dam *	APR-JUL	522.0	420.0	80	107	54				
	APR-SEP	570.0	460.0	80	107	55				
TWO MEDICINE CREEK near Browning *	APR-JUL	235.0	195.0	82	121	45				
	APR-SEP	248.0	206.0	83	119	47				
BADGER CREEK near Browning	APR-JUL	113.0	92.5	81	119	44				
	APR-SEP	130.0	108.0	83	119	47				
SWIFT RESERVOIR Inflow nr Dupuyer	APR-JUL	74.7	62.0	82	120	46				
	APR-SEP	86.7	72.0	83	119	47				
CUT BANK CREEK at Cut Bank	APR-JUL	108.0	90.0	83	121	45				
	APR-SEP	114.0	94.0	82	118	46				
MARIAS RIVER near Shelby	APR-JUL	518.0	388.0	74	111	39				
	APR-SEP	542.0	412.0	76	112	40				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
GIBSON	99.1	66.0	47.1	40.8
PISHKUN	32.0	18.4	18.5	16.5
WILLOW CREEK	32.2	20.4	12.6	20.4
LOWER TWO MEDICINE LAKE		NO REPORT		
FOUR HORNS LAKE		NO REPORT		
SWIFT	30.0	21.9	7.9	14.1
LAKE FRANCES	112.0	62.9	23.8	69.9
LAKE ELWELL (TIBER)	1347.0	720.0	675.8	545.6

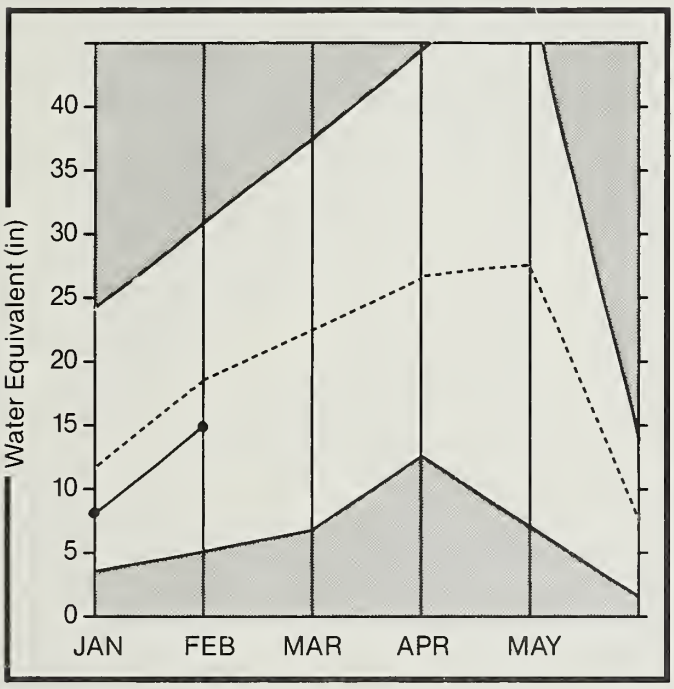
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
SUN-TETON	3	71	70
MARIAS	5	77	75
SUN-TETON-MARIAS	8	75	73

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

St. Mary and Milk Basins

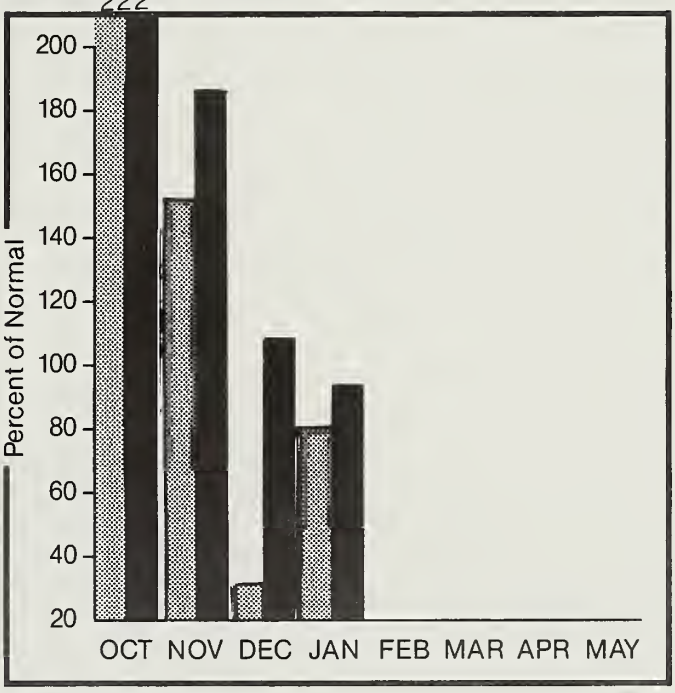
Mountain snowpack* (inches)



*St. Mary

Maximum
Average
Minimum
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK

Snowpack percentages have dropped drastically in the Bear Paws where January precipitation was about 50 to 60 percent of average. Snow cover in the Milk and St. Mary headwaters is about 80 percent of average. Mountain precipitation in the St. Mary headwaters was near average in January. Streamflows are forecast to be about 85 percent of average on the St. Mary and 80 percent of average on the Milk.

For more information contact your local Soil Conservation Service office.

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
SWIFTCURRENT CREEK at Sherburne *	APR-JUL	112.0	95.0	84	109	61				
	APR-SEP	128.0	110.0	85	110	62				
ST. MARY RIVER near Babb *	APR-JUL	416.0	350.0	84	102	66				
	APR-SEP	487.0	410.0	84	102	66				
MILK RIVER at Eastern Crossing *	MAR-SEP	279.0	264.0	94	132	76				
MILK RIVER at Eastern Crossing	MAR-SEP	109.0	87.2	80	117	62				

RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
LAKE SHERBURNE	64.3	35.3	35.2	19.5
FRESNO	127.0	42.7	9.9	58.0
BEAVER CREEK	3.5	2.9	0.9	1.7
NELSON	66.8	30.0	13.2	40.0

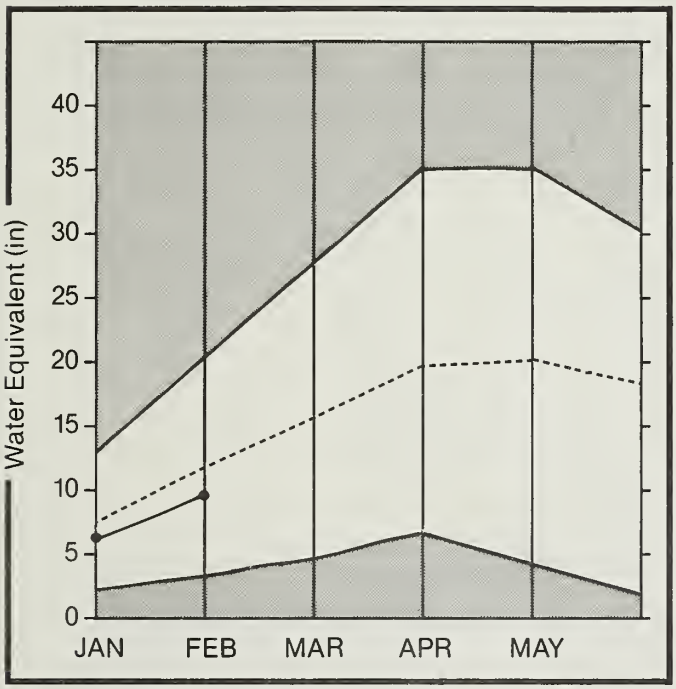
WATERSHED SNOWPACK ANALYSIS

WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	THIS YEAR AS % OF AVERAGE
MILK HEADWATERS	4	55	61
BEAR PAWS	6	39	52
MILK RIVER	10	51	59
ST. MARY'S	5	65	69
BOW RIVER	8	124	108
OLDMAN RIVER in ALBERTA	0	0	0

*Corrected for upstream diversions or changes in reservoir storage.
Average is for 1961-80 period.

Yellowstone Basin

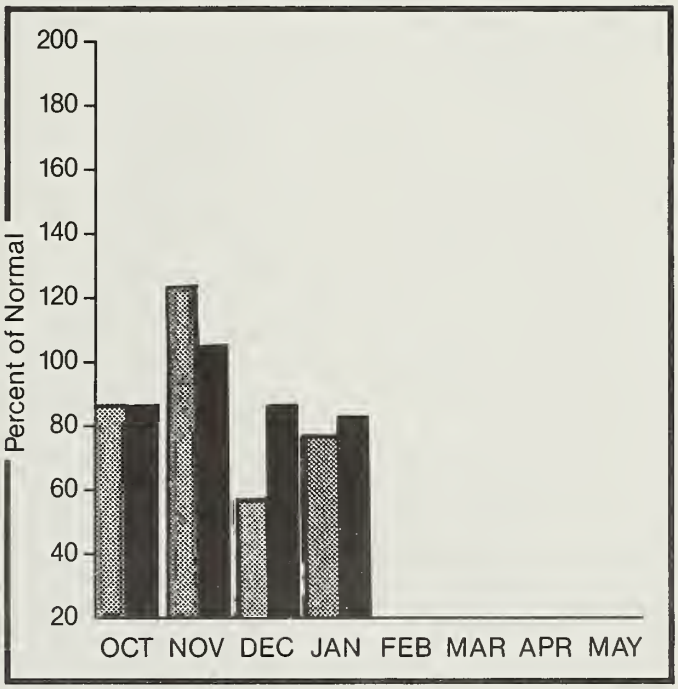
Mountain snowpack* (inches)



* Yellowstone above Big Horn

Maximum
Average
Minimum
Current

Precipitation* (percent of normal)



*Based on selected stations

Monthly precipitation
Year to date precipitation

WATER SUPPLY OUTLOOK:

Snowpack varies from around 60 percent of average in the Shields drainage to near average in the Bighorn, Tongue, and Powder River headwaters. In the Yellowstone headwaters, mountain precipitation was about 75 percent of average during January. Forecasts of spring and summer runoff are from 80 to 90 percent of average on the Yellowstone system and near average on the Bighorn, Tongue and Powder Rivers.

For more information contact your local Soil Conservation Service office.

YELLOWSTONE RIVER BASIN

STREAMFLOW FORECASTS

FORECAST POINT	FORECAST PERIOD	20 YR. AVE. (1000AF)	MOST PROBABLE (1000AF)	MOST PROBABLE (% AVE.)	REAS. MAX. (% AVE.)	REAS. MIN. (% AVE.)	PEAK FLOW (CFS)	PEAK DATE	LOW FLOW (CFS)	LOW DATE
YELLOWSTONE at Lake Outlet	APR-SEP	826.0	725.0	87	105	71				
YELLOWSTONE at Corwin Springs	APR-JUL	1686.0	1367.0	81	99	63				
	APR-SEP	2027.0	1640.0	80	99	63				
YELLOWSTONE near Livingston	APR-JUL	1969.0	1531.0	77	96	60				
	APR-SEP	2379.0	1852.0	77	96	60				
BOULDER RIVER at Big Timber	APR-JUL	366.0	310.0	84	111	59				
	APR-SEP	398.0	335.0	84	110	58				
STILLWATER RIVER nr Absarokee *	APR-JUL	528.0	454.0	85	120	52				
	APR-SEP	632.0	550.0	87	121	53				
CLARKS FORK RIVER near Belfry	APR-JUL	563.0	475.0	84	116	52				
	APR-SEP	628.0	534.0	85	117	53				
COONEY RESERVOIR Inflow	APR-JUL	49.5	45.0	90	125	57				
	APR-SEP	60.5	54.0	89	124	55				
YELLOWSTONE RIVER at Billings	APR-JUL	3833.0	3201.0	83	109	65				
	APR-SEP	4516.0	3690.0	81	107	63				
BIGHORN RIVER near St. Xavier *	APR-JUL	1794.0	1794.0	100	128	70				
	APR-SEP	1976.0	2020.0	102	131	72				
LITTLE BIGHORN RIVER near Hardin	APR-JUL	162.0	165.0	102	135	45				
	APR-SEP	182.0	191.0	104	137	48				
TONGUE RIVER near Decker	APR-JUL	244.0	250.0	102	160	37				
	APR-SEP	269.0	269.0	100	158	35				
YELLOWSTONE RIVER at Miles City *	APR-JUL	5906.0	5025.0	85	123	62				
	APR-SEP	6787.0	5987.0	88	125	64				
POWDER RIVER at Moorehead	APR-JUL	243.0	255.0	105	150	40				
	APR-SEP	263.0	278.0	105	152	40				
YELLOWSTONE RIVER near Sidney *	APR-JUL	6544.0	5628.0	86	125	59				
	APR-SEP	7518.0	6622.0	88	127	61				

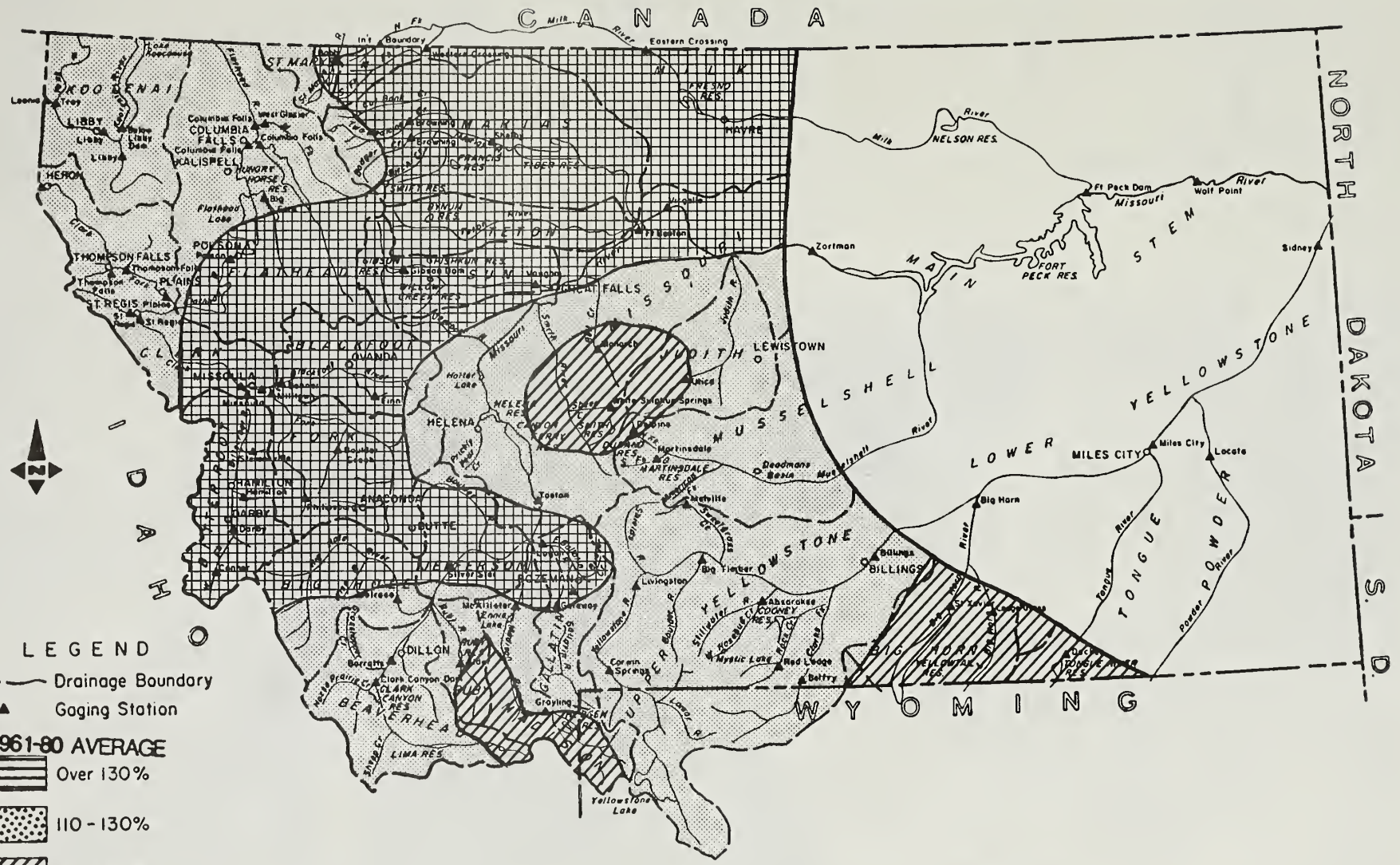
RESERVOIR STORAGE (1000AF)

RESERVOIR	USEABLE CAPACITY	** USEABLE STORAGE ** THIS YEAR	LAST YEAR	AVE.
MYSTIC LAKE	21.0	3.2	2.3	10.3
COONEY	27.4	15.8	18.8	14.0
BIGHORN LAKE	1356.0	731.0	907.4	609.2
TONGUE RIVER	68.0	12.4	16.6	30.2

*Corrected for upstream diversions or changes in reservoir storage. Average is for 1961-80 period.

WATERSHED SNOWPACK ANALYSIS

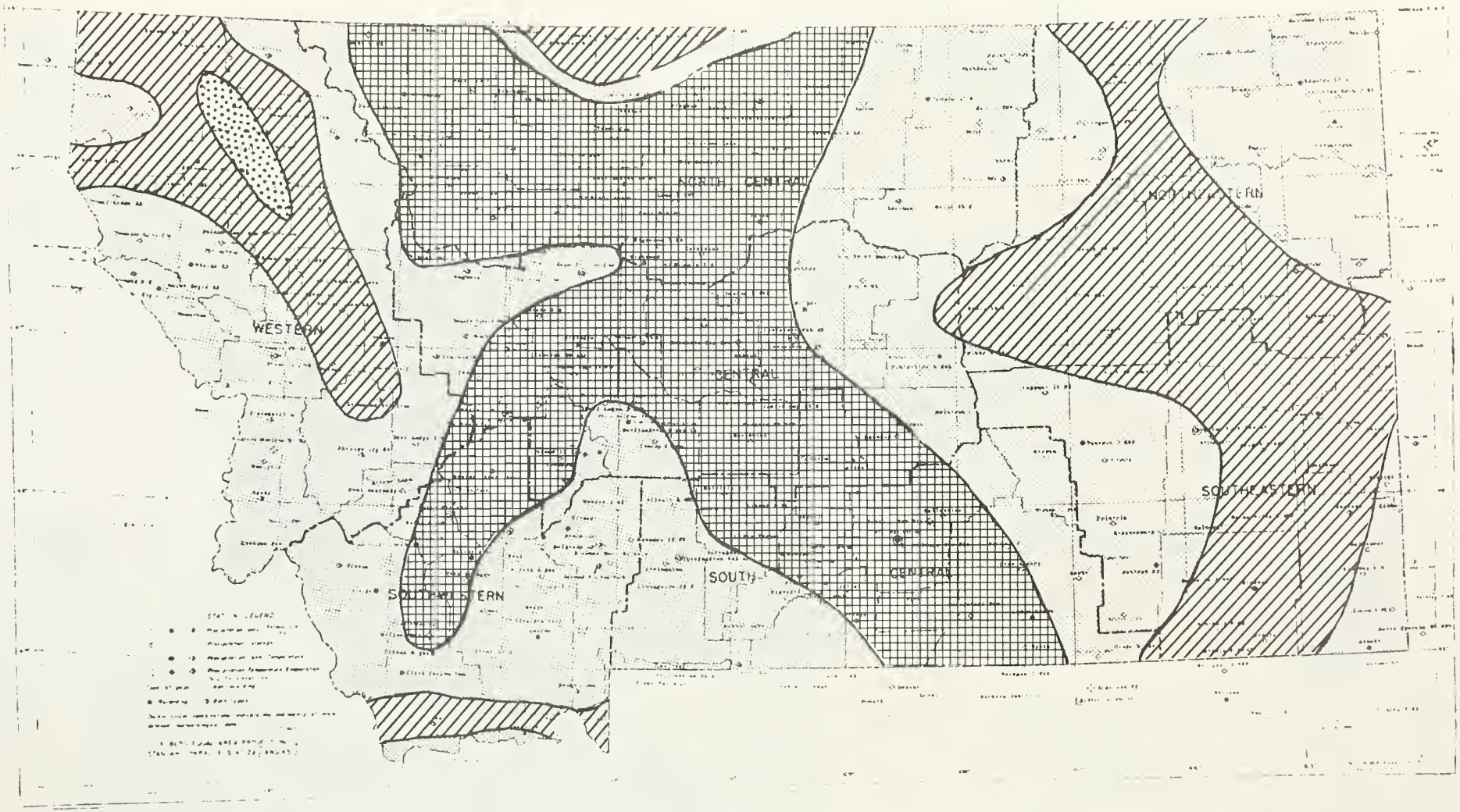
WATERSHED	NO. COURSES AVE.D	THIS YEAR AS % OF LAST YR.	AVERAGE
YELLOWSTONE ab LIVINGSTON	13	105	85
SHIELDS	6	87	58
BOULDER-STILLWATER	4	113	82
CLARK'S FORK-ROCK CREEK	13	123	89
YELLOWSTONE above BIGHORN	36	109	81
LITTLE BIGHORN	5	138	106
BIGHORN (Boysen-Bighorn)	34	132	103
UPPER TONGUE RIVER	10	120	100
POWDER RIVER	29	126	101
YELLOWSTONE RIVER	81	122	91



MONTANA
MOUNTAIN SNOW WATER EQUIVALENT

FEBRUARY 1, 1986

VALLEY PRECIPITATION



Over 120%

80 - 120%

50 - 80%

Under 50%

JANUARY 1986

Source: NWS
Great Falls, MT

The Following Organizations Cooperate With The Soil Conservation Service In Snow Survey Work

Canadian

Department of the Environment
- Atmospheric Environment Service
- Water Management Service

British Columbia Ministry of Environment
- Inventory and Engineering Branch, Hydrology Section

Alberta Environment
- Technical Services Division

Federal

U.S. Department of Agriculture
- Forest Service

U.S. Department of the Army
- Corps of Engineers

U.S. Department of Commerce
- NOAA, National Weather Service
- National Environmental Satellite Service

U.S. Department of the Interior
- Bureau of Indian Affairs
- Fish and Wildlife Service
- Geological Survey
- National Park Service
- Bureau of Reclamation

U.S. Department of Energy
- Bonneville Power Administration

State

Montana Conservation Districts
Montana Department of Fish, Wildlife, and Parks
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana State University - Agricultural Experiment Station
University of Montana - School of Forestry

Private

Big Sky of Montana
Butte Water Company
Flathead Valley Community College
Montana Power Company
Pondera County Canal & Reservoir Company

Other organizations and individuals furnish information for the snow survey reports. Their cooperation is gratefully acknowledged.

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
SNOW SURVEY UNIT
Federal Bldg., Rm. 443
10 East Babcock Street
Bozeman, MT 59715

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